



# UNITED STATES PATENT AND TRADEMARK OFFICE

UNITED STATES DEPARTMENT OF COMMERCE

United States Patent and Trademark Office

Address: COMMISSIONER FOR PATENTS

P.O. Box 1450

Alexandria, Virginia 22313-1450

www.uspto.gov

APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/535,671	05/19/2005	Susumu Yamamoto	272235US0PCT	7666
22850	7590	07/23/2008		
OBLON, SPIVAK, MCCLELLAND MAIER & NEUSTADT, P.C. 1940 DUKE STREET ALEXANDRIA, VA 22314				
EXAMINER				
VERDERAME, ANNA L.				
ART UNIT		PAPER NUMBER		
1795				
NOTIFICATION DATE		DELIVERY MODE		
07/23/2008		ELECTRONIC		

**Please find below and/or attached an Office communication concerning this application or proceeding.**

The time period for reply, if any, is set in the attached communication.

Notice of the Office communication was sent electronically on above-indicated "Notification Date" to the following e-mail address(es):

patentdocket@oblon.com

oblonpat@oblon.com

jgardner@oblon.com

# Office Action Summary

**Application No.**

10/535,671

**Applicant(s)**

YAMANOBÉ ET AL.

**Examiner**

ANNA L. VERDERAME

**Art Unit**

1795

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --  
**Period for Reply**

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

**Status**

- 1) ☒ Responsive to communication(s) filed on 03 April 2008.  
2a) ☐ This action is **FINAL**. 2b) ☒ This action is non-final.  
3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

**Disposition of Claims**

- 4) ☒ Claim(s) 1-6 and 10-31 is/are pending in the application.  
4a) Of the above claim(s) \_\_\_\_\_ is/are withdrawn from consideration.  
5) ☐ Claim(s) \_\_\_\_\_ is/are allowed.  
6) ☒ Claim(s) 1-6 and 10-31 is/are rejected.  
7) ☐ Claim(s) \_\_\_\_\_ is/are objected to.  
8) ☐ Claim(s) \_\_\_\_\_ are subject to restriction and/or election requirement.

**Application Papers**

- 9) ☐ The specification is objected to by the Examiner.  
10) ☒ The drawing(s) filed on 19 May 2005 is/are: a) ☒ accepted or b) ☐ objected to by the Examiner.  
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).  
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).  
11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

**Priority under 35 U.S.C. § 119**

- 12) ☒ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).  
a) ☒ All b) ☐ Some \* c) ☐ None of:  
1. ☒ Certified copies of the priority documents have been received.  
2. ☐ Certified copies of the priority documents have been received in Application No. \_\_\_\_\_.  
3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

\* See the attached detailed Office action for a list of the certified copies not received.

**Attachment(s)**

- 1) ☒ Notice of References Cited (PTO-892)  
2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)  
3) ☐ Information Disclosure Statement(s) (PTO/S508)  
Paper No(s)/Mail Date \_\_\_\_\_  
4) ☐ Interview Summary (PTO-413)  
Paper No(s)/Mail Date \_\_\_\_\_  
5) ☐ Notice of Informal Patent Application  
6) ☐ Other: \_\_\_\_\_

### DETAILED ACTION

The amendment filed on April 3, 2008 has been carefully considered. A response is presented below.

#### ***Claim Rejections - 35 USC § 103***

1. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

2. Claims 1-3, 5-6, 10-17, 18-20, and 22-31 are rejected under 35 U.S.C. 103(a) as being unpatentable over Susi et al. 3,670,025 in view of Onishi et al. US 6,214,435, and Busman et al. 5,541,235.

Susi et al. teaches dyes at (1/15-3/35 and abstract). Organic as well as inorganic counter-ions are taught at (3/35-50). Fluorinated organic counter-ions including trifluoroacetate are taught. Use in filters is disclosed at (6/45-70 and 4/64-75). Use of solvents such as acetone and DMF is taught in the abstract. The use of these in filters is taught in column 4 and 6. See also dyes b,c,h and l in the table in column 13.

Onishi et al. teaches aminium compounds with organic counter-ions (2/1-4/34). Onishi also teaches that aminium salts having counter-ions such as perchlorate, and antimony hexafluoride are hazardous (1/43-50). Antimony hexafluoride salts have poor solubility as well(1/45).

Busman teaches a **cationic dye** in a ketone solvent wherein the cationic dye has a counterion which comprises a linear, branched, or cyclic highly fluorinated alkylsulfonyl methide or fluorinated **alkyl sulfonyl imide**(abstract).

The solubility of cationic dye materials in organic solvents and particularly in low polarity solvents such as **methyl ethyl ketone** can be improved using the particular class of counterions in association with the cations(3/20-24). Broad disclosure of cationic dyes including those recognized in the dye and photographic industries(3/29-39). Trifluoromethyl group of claim 3 is disclosed at (4/39). Pentafluorethyl group of claim 3 is disclosed at (4/36). Hexafluoropropylene group is disclosed at (4/50). Reduction of coating defects is also achieved due to the solubility of the salts in the wide array of solvents(4/58-62).

Busman et al. teaches previously used counterions such as  $\text{SbF}_6^-$ ,  $\text{I}^-$ , and  $\text{PF}_6^-$  at (1/36-44).

It would have been obvious to one of ordinary skill in the art to modify the filter layer of Susi et al. comprising a diimonium salt by using any one of the highly fluorinated alkyl sulfonyl imide counterions taught by Busman et al. based on the disclosure of fluorinated organic counter-ions in Susi et al. and based on the disclosure in Busman et al. that the highly fluorinated alkyl sulfonyl imide counterions may be used with cationic dyes generally and with the reasonable expectation of increasing the solubility of the cationic dye and thereby decreasing the occurrence of coating defects as taught by Busman et al.. One of ordinary skill in the art would be motivated to choose the fluorinated organic counter-ion

Art Unit: 1795

over the inorganic counter-ions such as perchlorate, and antimony hexafluoride, also disclosed by Susi et al. based on disclosure that these fluorinated organic counter-ions are more soluble and based on the disclosure in Onishi et al. that the inorganic counter-ions are hazardous. Further it would have been obvious to use the resultant IR dyes in filters based upon the disclosure of Susi et al..

Susi et al. was applied instead of Kitayama et al. in order to address the applicant's exclusion of cyanoalkyl groups in claim 1.

The applicant's declaration shows an increase in solubility when using  $\text{SbF}_6^-$  instead of  $\text{ClO}_4^-$ . The declaration does not show the relative solubility when using the specific anions taught in Busman. The applicant claims that because the solubility of  $\text{ClO}_4^-$  and  $\text{SbF}_6^-$  fall within the desired range taught by Busman at and therefore there would be no motivation to use the specific anions advocated by Busman. However, because the applicant has not shown that the anions taught by Busman do not in fact exhibit higher solubility than either  $\text{SbF}_6^-$  and  $\text{ClO}_4^-$ , it is the position of the examiner that one of ordinary skill in the art would have been motivated to use these anions to obtain greater solubility in polar solvents like MEK based on the disclosure of Busman. Further, Onishi teaches that antimony hexafluoride and perchlorates are toxic. One of ordinary skill in the art would be motivated to seek alternatives to these inorganic counter-ions that are non-toxic and thus could be handled/disposed of easily and would be environmentally friendly, such as organic counterions.

Art Unit: 1795

3. Claim 4 and 21 rejected under 35 U.S.C. 103(a) as being unpatentable over Susi et al. 3,670,025, Onishi et al. US 6,214,435, and Busman et al. 5,541,235 as applied above and further in view of Koshar 4,429,093.

Koshar teaches perfluoroaliphaticdisulfonimides counterions (anions) as represented in formula 1 (1/51-60). In figure 1 R<sub>f</sub> is a perfluoroalkylene having 2 to 4 backbone or catenary carbon atoms or perfluorocycloalkylene having 4 to 7 preferably 6 ring atoms(1/60-63). M is a cation with a valence equal to n(1/66-2/6).

The teachings of Koshar establish that perfluoroaliphaticdisulfonimides exist and that they are used as a negatively charged counterions. The chemical similarity between the anions taught by Koshar at 1/52-63 and the fluorinated alkyl sulfonyl imide counterions taught by Busman is noted.

It would have been obvious to one of ordinary skill in the art to modify the filter layer rendered obvious by the combination Susi et al. 3,670,025, Onishi et al. US 6,214,435, and Busman et al. 5,541,235 by replacing the fluorinated organic counter-ions with the counter-ions taught by Koshar at (1/52-63) based on the chemical similarity between these counter-ions and those disclosed by Busman et al. and based on the disclosure in Busman et al. that the fluorinated alkyl sulfonyl imide counterions may be used with cationic dyes generally, and with the reasonable expectation that the counterions taught by Koshar will effectively neutralize the positive charge of the diimonium compound, and will also increasing the solubility of the cationic dye thereby decreasing the occurrence of coating defects as taught by Busman et al..

***Conclusion***

4. The prior art made of record and not relied upon is considered pertinent to applicant's disclosure.

Onomichi et al. JP-2001-264532(English language translation provided)-  
Onomichi teaches a IR-ray absorbing filter formed by laminating an IR absorbing layer having an IR-ray absorbing dye and a polymer resin on a transparent base. The IR-ray absorbing dye is at least a diimonium salt compound. See absorption spectra of IR-absorbing layers are shown in figures 1-9. A diimonium salt according to the invention is taught at (0017). In this structure R1-R8, which correspond to applicant's R<sub>2</sub>, can be a hydrogen atom, an alkyl group, an aryl group, an alkenyl group, an **aralkyl** group, and an alkynyl group. Substituents R1-R8 may all be the same or they can be different. R9-R12 can be hydrogen and others. Substituents R9-R12 can be the same or different. X<sup>-</sup> is a negative ion. X<sup>-</sup> can be a fluorine ion, a chloride ion, a bromine ion, an iodide ion, a perchlorate ion, a hexafluoro antimonate ion (SbF<sub>6</sub><sup>-</sup>), hexa fluorophosphoric acid (PF<sub>6</sub><sup>-</sup>), tetrafluoroborate anion (BF<sub>4</sub><sup>-</sup>)(0037). Use of solvents such as methyl ethyl ketone, tetrahydrofuran and toluene to form a coating solution is disclosed at (0099).

It is the position of the examiner that the general disclosure that any of R1-R8 can be an aralkyl group meets the limitations recited in claims 14-17.

Art Unit: 1795

5. Any inquiry concerning this communication or earlier communications from the examiner should be directed to Anna L. Verderame whose telephone number is (571)272-6420. The examiner can normally be reached on M-F 8A-4:30P.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Mark Huff can be reached on (571)272-1385. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

/Martin J Angebrannt/  
Primary Examiner, Art Unit 1795

/A. L. V./

Examiner, Art Unit 1795